Related Pending Application
Related Case Serial No: 10/020,220
Related Case Filing Date: 12-18-01

WHAT IS CLAIMED AS NEW AND IS DESIRED TO BE SECURED BY LETTERS PATENT OF THE UNITED STATES IS:

1. An arrayed waveguide grating comprising:

at least one first optical waveguide;

a first slab waveguide;

an arrayed waveguide connected to said at least one first optical waveguide via said first slab waveguide, said arrayed waveguide comprising a plurality of channel waveguides each of which has a different length;

a second slab waveguide; and

a plurality of second optical waveguides connected to said arrayed waveguide via said second slab waveguide,

wherein a number of the plurality of channel waveguides is determined such that a crosstalk is at most a predetermined value.

2. An arrayed waveguide grating according to Claim 1, wherein said predetermined value is about –26 dB.

3. An arrayed waveguide grating comprising:

at least one first optical waveguide;

a first slab waveguide;

an arrayed waveguide connected to said at least one first optical waveguide via said first slab waveguide, said arrayed waveguide comprising a plurality of channel waveguides each of which has a different length;

a second slab waveguide; and

a plurality of second optical waveguides connected to said arrayed waveguide via said second slab waveguide,

wherein a number of the plurality of channel waveguides is determined such that

optical amplitude distribution at an interface between the first slab waveguide and one of the at least one first optical waveguide is substantially reproduced at interfaces between the second slab waveguide and the plurality of second optical waveguides.

4. An arrayed waveguide grating comprising:

at least one first optical waveguide;

a first slab waveguide;

an arrayed waveguide connected to said at least one first optical waveguide via said first slab waveguide, said arrayed waveguide comprising a plurality of channel waveguides each of which has a different length;

a second slab waveguide; and

a plurality of second optical waveguides connected to said arrayed waveguide via said second slab waveguide,

wherein an optical transmittance of the arrayed waveguide grating has gaussian-shaped wavelength dependency, and

wherein a number of the plurality of channel waveguides is determined such that optical amplitude distribution transmitted in the arrayed waveguide includes only main beam and first side lobes which appear on both sides of the main beam.

5. An arrayed waveguide grating according to Claim 4, wherein the number of the plurality of channel waveguides is determined such that the optical amplitude distribution includes only the main beam and a part of the first side lobes.

6. An arrayed waveguide grating according to Claim 4, wherein the number of the plurality of channel waveguides is determined such that the optical amplitude distribution includes only the main beam and an entirety of the first side lobes.

7. An arrayed waveguide grating comprising:

at least one first optical waveguide;

a first slab waveguide;

an arrayed waveguide connected to said at least one first optical waveguide via said first slab waveguide, said arrayed waveguide comprising a plurality of channel waveguides each of which has a different length;

a second slab waveguide; and

a plurality of second optical waveguides connected to said arrayed waveguide via said second slab waveguide,

wherein an optical transmittance of the arrayed waveguide grating has rectangular-shaped wavelength dependency, and

wherein a number of the plurality of channel waveguides is determined such that optical amplitude distribution transmitted in the arrayed waveguide includes only main beam, first side lobes which appear on both sides of the main beam, and second side lobes each appearing on an outer side of each of the first side lobes.

8. An arrayed waveguide grating according to Claim 7, wherein the number of the plurality of channel waveguides is determined such that the optical amplitude distribution includes only the main beam, the first side lobes and a part of the second side lobes.

9. An arrayed waveguide grating according to Claim 7, wherein the number of the plurality of channel waveguides is determined such that the optical amplitude distribution includes only the main beam, the first side lobes and an entirety of the second side lobes.

10. A method for manufacturing an arrayed waveguide grating, comprising:

providing at least one first optical waveguide;

providing a first slab waveguide;

providing an arrayed waveguide to be connected to said at least one first optical waveguide via said first slab waveguide, said arrayed waveguide comprising a plurality of channel waveguides each of which has a different length;

providing a second slab waveguide; and

providing a plurality of second optical waveguides to be connected to said arrayed waveguide via said second slab waveguide; and

determining a number of the plurality of channel waveguides such that a crosstalk is at most a predetermined value.

11. A method according to Claim 10, wherein said predetermined value is about –26 dB.

12. A method for manufacturing an arrayed waveguide grating, comprising:

providing at least one first optical waveguide;

providing a first slab waveguide;

providing an arrayed waveguide to be connected to said at least one first optical waveguide via said first slab waveguide, said arrayed waveguide comprising a plurality of channel waveguides each of which has a different length;

providing a second slab waveguide;

providing a plurality of second optical waveguides to be connected to said arrayed waveguide via said second slab waveguide; and

determining a number of the plurality of channel waveguides such that optical amplitude distribution at an interface between the first slab waveguide and one of the at least one first optical waveguide is substantially reproduced at interfaces between the second slab waveguide and the plurality of second optical waveguides.

13. A method for manufacturing an arrayed waveguide grating, comprising:

providing at least one first optical waveguide;

providing a first slab waveguide;

providing an arrayed waveguide to be connected to said at least one first optical waveguide via said first slab waveguide, said arrayed waveguide comprising a plurality of

channel waveguides each of which has a different length;

providing a second slab waveguide;

providing a plurality of second optical waveguides to be connected to said arrayed waveguide via said second slab waveguide;

providing the arrayed waveguide grating with an optical transmittance having gaussian-shaped wavelength dependency; and

determining a number of the plurality of channel waveguides such that optical amplitude distribution transmitted in the arrayed waveguide includes only main beam and first side lobes which appear on both sides of the main beam.

14. A method according to Claim 13, wherein the number of the plurality of channel waveguides is determined such that the optical amplitude distribution includes only the main beam and a part of the first side lobes.

15. A method according to Claim 13, wherein the number of the plurality of channel waveguides is determined such that the optical amplitude distribution includes only the main beam and an entirety of the first side lobes.

16. A method for manufacturing an arrayed waveguide grating, comprising:

providing at least one first optical waveguide;

providing a first slab waveguide;

providing an arrayed waveguide to be connected to said at least one first optical waveguide via said first slab waveguide, said arrayed waveguide comprising a plurality of channel waveguides each of which has a different length;

providing a second slab waveguide;

providing a plurality of second optical waveguides to be connected to said arrayed waveguide via said second slab waveguide;

providing the arrayed waveguide grating with an optical transmittance having

rectangular-shaped wavelength dependency; and

determining a number of the plurality of channel waveguides such that optical amplitude distribution transmitted in the arrayed waveguide includes only main beam, first side lobes which appear on both sides of the main beam, and second side lobes each appearing on an outer side of each of the first side lobes.

17. A method according to Claim 16, wherein the number of the plurality of channel waveguides is determined such that the optical amplitude distribution includes only the main beam, the first side lobes and a part of the second side lobes.

18. A method according to Claim 16, wherein the number of the plurality of channel waveguides is determined such that the optical amplitude distribution includes only the main beam, the first side lobes and an entirety of the second side lobes.